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ABSTRACT

In 1996, Tennessee became the first state to connect every public school to the Internet via a single network, ConnecTEN. This case study examines the staff development opportunities made available to teachers for training in the use of computer-based technology, focusing on teachers' perceptions of the effectiveness of the training and their integration of the Internet into their curriculum. The training involved a series of faculty meetings to discuss Internet uses in education, an in-house workshop on how to use the system, and day and evening courses available to address Internet topics. The case study group consisted of 47 faculty members at one urban public elementary school. Data were collected over 7 months using a series of surveys and interviews (via the Internet Experience Survey, Internet Training Evaluation Form, Internet Use Tally, and ConnecTEN Teacher Training Interviews). Results indicated that most faculty members had not received Internet training, and of those who were trained, most felt the training was not adequate. The teachers had four key issues concerning the effective classroom use of the Internet: sufficient access; adequate use and practice time; readily available and effective training; and conspicuous administrative support. (Contains 20 references.) (Author/SM)

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ConnecTEN: A Case Study of Technology Training for Teachers

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ConnecTEN: A Case Study of Technology Training for Teachers

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Abstract

In 1996, Tennessee became the first state in the nation to connect every public school to the Internet via a single network (ConnecTEN). This case study examines the staff development opportunities made available to teachers to train them in the use of computer-based technology. The primary focus is on teachers' perceptions of the effectiveness of the training and their integration of the Internet into their curriculum. The case study group consisted of 47 public school teachers. Data was collected over a 7 month period using a series of surveys and interviews. Findings indicate that the teachers had four key issues concerning the effective classroom use of the Internet. The issues are: sufficient access; adequate use and practice time; readily available and effective training; and conspicuous administrative support. Failure to appropriately address all areas of concern will result in a less effective technology integration program. Implications for technology training are discussed.

ConnecTEN: A Case Study of Technology Training for Teachers

Simonson and Thompson (1997), argue that the most critical reasons for the lack of effective use of technology in today's school systems are that teachers need to be allotted the time to learn how to use computers, computer-related technologies, and to be taught how to effectively integrate these technologies into their daily curriculum. They further state that while money is being spent on hardware and software, adequate funding has not been forthcoming for teacher training. For years, researchers have been reporting that in-service training is an urgent and critical need for successful implement of technology programs (Edwards, 1980; Gallo & Horton, 1994; Stuckey, 1995; Knapp & Glenn, 1996). Failure to provide adequate staff development training as computers enter schools does endanger the success of any technology implementation program.

The problem is further exacerbated by the fact that most teachers have not received systematic exposure to technology or been taught the art of integrating technology in their teacher preparation courses (Faison, 1996). The Office of Technology and Assessment (1995) concludes that "technology is not central to the teacher preparation experience...consequently, most teachers graduate...with limited knowledge of the ways technology can be used in their professional practice" (p. 165). Finally, Werner (1994) states that, relatively few teachers, on their own, have been able to develop the skills required to make effective use of the Internet. Therefore, staff development is essential if computers and related technology are to be effectively integrated into the classroom.

This paper focuses on one case of teacher training as it relates to teachers' use and integration of the Internet into their curriculum. The ConnecTEN project (Salvador, 1996) and how it was implemented at Hamilton Elementary School will provide the specific context within which the professional development aspect will be studied. This case study examines the professional development efforts and opportunities afforded teachers by various governmental and private agencies and their impact on Hamilton Elementary School's faculty.

Overview of the Program

The idea of the ConnecTEN Project was a result of the collaborative efforts of Tennessee Governor Don Sundquist and Tennessee Education Commissioner Jane Walters. The ConnecTEN Project goal was to be to make Tennessee the first state in the nation to connect all of its public schools to the Internet via a single network (Niendorf, 1996). This network is to provide access to the Internet for all 50,000 public school teachers and all 860,000 public school students in the state of Tennessee. The ConnecTEN Project grew out of the foundations laid by the Tennessee Education Network (TEN). The $11.2 million TEN initiative provided hardware and software that allowed for e-mail and text based accessibility to the Internet for some public schools. The ConnecTEN Program added $5 million to build upon the TEN backbone. The primary objectives were to connect all 1560 public schools in the state to the Internet, add graphical access upgrades, and to train teachers in the use of the Internet.

Hamilton Elementary School is a part of the Memphis City School District located in Memphis, Tennessee. Hamilton Elementary is an urban, community based public school. The school serves approximately 780 students with 47 faculty members. Hamilton Elementary School via the Library Media Center was first connected to TEN in 1995 and ConnecTEN in 1996. Hardware and software which made these connections possible were provided by state and local government agencies.

Purpose

The purpose of this case study is to examine teachers' responses to technology training they received as a part of the ConnecTEN project. Jane Walters, Commissioner of Tennessee State Department of Education, has stated that "215 teams of local educators will be trained not only in technology, but in using the Internet across the curriculum. These peer trainers will then

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instruct teachers in their districts on classroom use of the Internet.....all teachers will be trained in its use" (Salvador, 1996, p. 8). In addition to the 215 teams, other Internet training for teachers has been offered through school board coordinated training sessions, local colleges and universities, technology conferences, seminars, and in-services.

The case study will focus on the types, the amount, and the accessibility of ConnecTEN based Internet professional development available to the teachers at Hamilton Elementary School. Questions explored included: Who provided the Internet training for the teachers?; was the training made available for all teachers?; were the number of training times and training opportunities available adequate?; was the training available at sites and/or times accessible to teachers?; and was the training practical and relevant to your teaching situation? A second program element to be briefly discussed will be a comparison between the administrators' and trainers' statements concerning the Internet training programs versus the beliefs of individual teachers.

Training

In June, the State Department provided training consisting of a 2 hour presentation and demonstration with its primary goal being how to install Netscape Navigator on to the ConnecTEN system. The training took place at the National Guard Armory in Millington, TN. The training was conducted by individuals sent from the State Department of Education and the National Guard Armory personnel. One or two representatives from each school in the district were to be sent to the ConnecTEN training. Hamilton Elementary School sent one, the library media specialist.

The Hamilton Elementary School Faculty were first provided with information and training concerning ConnecTEN and the Internet through a series of faculty meetings and an in-house workshop. In August, at an educator's meeting, the faculty were given a briefing on the

purpose and scope of the technology initiative by the school's principal and library media specialist. At a follow-up meeting in October, the Hamilton Elementary School Faculty participated in a presentation entitled *Technology Infusion in the Classroom: A Lesson and Feedback*. The unit plan, presented by two 1st grade teachers, demonstrated how the Internet could be integrated into the whole language structure that is used at Hamilton Elementary School. The computer systems specialist concluded the presentation by introducing and explaining the new Memphis City School Board mandated Acceptable Use Policies for the Internet and how it pertains to student, administration, faculty, and staff users.

The next step was to provide a faculty training workshop on how to access, use, and integrate the Internet into the curriculum. In December, a week was set aside to provide a 55 minute training session for every full time faculty member. The Library Media Specialist served as the trainer. The on-site workshop provided step by step hands-on training. It involved turning the computer on, accessing the Internet, and using URL and keyword searching via a variety of search engines. Each person was encouraged to search for sites of professional interest to them. All participants were also given several Internet guides which listed addresses of Web Sites that are of use to educators. The final day of the training week was free time, where anyone who wanted to could come in for individual Internet use time or for additional instructor guided practice. Finally, the workshop was designed where each teacher and staff member was paired with another whose job description was similar to their own. Research has shown that the use of a paired training approach encourages interaction between trainees that can stimulate ideas for the practical use of the Internet without a loss in the effectiveness of the training (Simonson and Thompson, 1997). Of the 47 faculty and staff members invited to the training, 46 participated. Two faculty members stayed for a second training session. The single nonparticipant had extensive Internet experience and felt she needed no further introductory training.

A third avenue of Internet training for teachers was provided by the Memphis City Schools Board of Education. The Memphis City Schools Teaching and Learning Academy offered courses in both the day and evening with 10 - 15 offerings per month. The classes varied in length from 2 to 6 hours. The courses ranged from beginner to expert. Some classes were very general in nature while others were specifically designed to address narrowly focused Internet related topics (i.e. building Web Sites). As a convenience, some of these same or similar courses were offered at the School Board's Professional Development Center. Interested employees could register by mail or FAX, and all classes were free. A survey of Hamilton's teachers in January revealed that only one teacher had attended this training. Five other teachers had attempted to attend, but stated the Internet courses they wished to attend were filled.

The University of Memphis and the State Technical Institute in Memphis, in conjunction with the Memphis City Schools Board of Education, have offered Internet training courses specifically designed for librarians and educators in Memphis City Schools since September 1994. Every month at least one class was offered on basic Internet skills (i.e. e-mail, search engines, etc.). These courses were set up as three 3 hour sessions (Park & Viles, 1996,). Initially, the State Department of Education paid for these courses if the course registration was processed through the Memphis City Schools Board of Education. Today, however, the teacher's school or the teacher themselves must pay for the course. The Internet Training Survey conducted in January indicated that 18 teachers and administrators had been trained at the University of Memphis (zero at State Technical Institute). By 1996 virtually all School Board coordinated Internet training for teachers was being arranged through the Teaching and Learning Academy and the Professional Development Center.

A smaller number of teachers and administrators have been sent to various technology showcase events. The primary focus of these experiences have been to expose educators to the cutting edge of technology as it pertains to the school environment. The premier example of this

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was the 1996 Technology + Learning Conference in Dallas, Texas. Hamilton Elementary School sent as representatives a 1st grade teacher, the computer specialist, and the library media specialist. The participants were able to discuss current products, trends, strategies, funding sources, and other topics of interest with educators from around the world. These type of professional development opportunities provided the participants with insight into the future of technology in the educational field. Seven teachers from Hamilton Elementary School attended at least one of these technology showcases.

Design

Participants

The study group were the 47 faculty members of Hamilton Elementary School. The faculty consisted of 36 teachers, 5 guidance and resource personnel, and 6 support teachers. The faculty ranged in teaching experience from 4 to 30+ years. The majority of faculty members had taught at Hamilton for over 5 years. The faculty is 55% African-American and 45% Caucasian, and consists of 44 females and 3 males. The faculty ranged in age from 24 to 63.

The Hamilton Elementary School Library Media Specialist served in the duel capacity of interviewer and participant-observer. This duel role helped minimize the possible bias of the interviewer failing to know the local context or setting in which the interviews were occurring. As a participant-observer, the library media specialist took field notes based on observing the trainees reactions and responses to the various Internet trainings. Also as a participant-observer, the Media Specialist was able to draw upon background knowledge to make the research more productive through encouraging respondents to fully explore and describe their answers (Holstein & Gubrium, 1995).

Data Collection

A series of surveys and interviews were conducted with the teachers from December through June. These included the Internet Experience Survey, Internet Training Evaluation Form, Internet Training Survey, Internet Use Tally, and the ConnecTEN Teacher Training Interviews. The use of multiple surveys and interviews was to provide a fuller reconstruction of the teachers' experiences, to better illuminate the entire context within which the Internet training occurred (Seidman, 1991).

The Internet Experience Survey was conducted in December immediately proceeding the Internet Training Workshop conducted at Hamilton Elementary School in the library media center. For the Internet Experience Survey, the Library Media Specialist verbally asked each teacher the question: How much experience have you had in using the Internet?

The Internet Training Evaluation form was designed to provided feedback on the Internet Training Workshop. The form was given to each of the workshop participants to anonymously fill out and return. The categories of training outcomes measured were: 1) What I Learned to Do; 2) Evaluation of Instruction; 3) Preparation Responsibilities of Instructor and Training; 4) Machine Applications; 5) Overall Assessment of Training Session; 6) Other Comments. The Likert scale ran from 5 = Excellent to 0 = Poor with the exception of Other Comments which required a written response.

in January, an Internet Training Survey was taken by the library media specialist to determine how much and where teachers were obtaining Internet training outside of the Hamilton Elementary School building. All 47 faculty members were individually asked and their responses hand recorded.

A faculty and student ConnecTEN Internet use tally was kept for the months January - April following the Internet Training Workshop. For purpose of analysis, these post-training statistics were compared to the pre-training levels of use. To provide a fuller view, a tally was

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kept for both actual Internet use and for the checking out of professional development materials concerning the Internet.

Finally, the ConnecTEN Teacher Training Interviews were conducted in June. For the purpose of this study, 11 open-ended interview questions were asked of the faculty by the participant-observer. Of the 47 faculty members, 34 agreed to be interviewed for this study. This number proved sufficient and the information saturation point was reached during the interview process (Seidman, 1991). The interview process was chosen to allow for a more indepth exploration of the topic. Before each interview, the participants were given a brief description of the study and were assured of individual anonymity. For added protection of confidentiality, the interviews were hand recorded (rather than using an audio or video recorder). The interviews were not rushed, allowing time to take written notes and to allow participants the opportunity to elaborate on their responses. Once completed, the field notes were edited and transcribed onto a computer.

Analysis

Techniques

The interview analysis is based upon the respondents answers to questions in four factor-based categories. The categories are comprised of the faculty's' perceptions of the Internet and the types, amount, and availability of training they have received. The four factors are the importance of Internet use in the school environment, their integration of the Internet into the curriculum, the adequacy of their training in the use of the Internet, and the effectiveness of the Internet training they have received. A grouping of the faculty's' responses to each of these categories of questions provides the framework for the case analysis.

The study was designed to use the case analysis technique to group together the study groups' answers to common interview questions. The answers to the interview questions were categorized using both analyst constructed and indigenous typologies (Patton, 1990). The interviews were valued equally. The questions were designed to provide a focus for respondents to reconstruct their experience and explore its meaning (Seidman, 1991). The questions fell into 5 content-related categories. After categorization, inductive analysis was used to look for convergence within the data. Creative synthesis of the data was used to identify emergent patterns, themes, and reoccurring regularities.

The Internet Experience Survey was taken by all 46 teachers who attended the Internet Training Workshop that occurred at Hamilton Elementary School. For analysis purposes, based on each teacher's response, the answers were grouped into the 3 categories of no experience, some experience, or much experience in the use of the Internet.

Findings

The Internet Experience Survey posed the question, "how much experience have you had in using the Internet?" Of the 47 faculty responses, 74% stated they had no experience, 17% some experience and 9% much experience in using the Internet.

All 46 participants of the Internet Training Workshops received an Internet Training Evaluation form. Of these, 61% of the forms were completed and returned. The results of the Post-Internet Training Evaluation were generally very favorable. The training overall received an average rating of more than 4.5 (90%) approval rating, except for "All Equipment Functional" and "Recognize Icon." These two questions were only slightly below 4.5. The reasons for the lower scores on these two questions were, however, immediately apparent to the participant-observer. The equipment during some of the mid-day training sessions did not appear to be functioning properly to the novice user due to the extremely poor response times and the

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occasional inability of the router to make the ConnecTEN Internet connection due to overly crowded transmission lines. In accordance, most of the mid-day sessions were rescheduled to avoid the peak use times. The Recognize Icon question was more of a semantics problem. Often during training, the trainer would fail to identify the Netscape or Microsoft Works symbols as icons. Instead of calling them icons, the trainer would merely refer to clicking on the "Works picture," "Netscape logo," or simply just "Works" or "Netscape." The trainer did not properly define the term icon (in its computer sense) in all of the training sessions conducted. Still, 89% of the trainees rated their ability to recognize icons as excellent.

The overall assessment of the Internet Training session was excellent. In the evaluation of instruction section, all respondents indicated excellent under Gained Knowledge of the Internet. Throughout all categories and questions, the evaluations indicated that trainees rated the quality of the Internet Instruction as excellent. In the comment section, 16 of the 28 evaluation forms had comments. Three indicated they would like additional training and practice time. Three stated that the training had excited them about using the Internet in the classroom. Two complained about connection and software problems. One respondent liked the training packets containing Web Site addresses. The remaining merely indicated their gratitude for being provided the Internet training experience.

The Internet Training Survey revealed that only 19 of the 47 faculty members had taken even one Internet Training Course outside of Hamilton Elementary School. Of those 19 who had taken courses, 18 attended classes at the University of Memphis while 1 took the offering at the Memphis City Schools Teaching and Learning Academy. Of the teachers who had received training, 7 were also attendees at one or more technology seminars or conferences (see figure 1). Of the 28 who have not taken a course, 5 stated that they had tried but the classes were filled, 3 new teachers stated they have never been offered the chance, 2 were Internet adept and

did not need the training, 2 said there was no plan to install computers and Internet in their classrooms (so why learn?), and the other 16 offered no reasons for failure to attend training. An additional finding was that those teachers who had already received training are likely to receive more in the future. Thirty-seven percent of those who attended Internet Training were sent to technology conferences and seminars. A core group of these 7 teachers got even more. Of this core group, 3 teachers have attended 3 or more educational technology related courses or seminars (see figure 1).

Figure 1: Teacher Internet Training

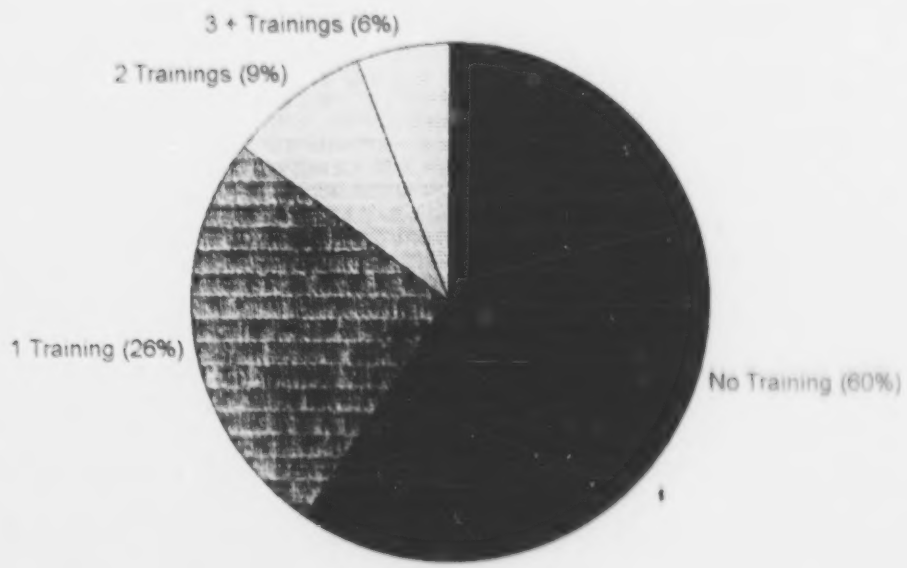

Figure 1. The percentage of teachers receiving each number of trainings (numbers may not actually total 100% due to rounding off).

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The Internet Use Tally showed that there had been virtually no ConnecTEN Internet use by faculty (with the exception of the library media specialist) and zero use by students before the Internet Training Workshop. After faculty training, the use rate increased significantly. Use was measured by either employees physically surfing the Internet or requesting from the library staff materials found on the Internet. For the 4 months following the training, Internet use averaged 9.3 teachers per week and 4.7 students per week. While the numbers are by no means overwhelming, they are a start considering the physical obstacles. Some of the obstacles include: 1) only one computer can access ConnecTEN; 2) the ConnecTEN computer is located on the third floor in the library, 3) students may not access the Internet without teacher supervision; 4) Teachers have not been allotted scheduled Internet time; and 5) the ConnecTEN system has experienced a number of problems including slow response time, down time, and software/hardware difficulties. Nonetheless, as a direct result of the in-school training, a marked increase in faculty, staff, and administrator use of the ConnecTEN Internet connection has taken place. Also of note, after the training Internet Materials (books, periodicals, files, and handouts) increased in circulation from 2 per month (Septemeber-December) to 19 per month (January-April).

The interview questions were separated into 4 categories based upon their content. Each of the category's responses were further divided into subcategories of emergent themes.

The first category was importance. The two subcategories of emergent themes were access and applicability. As Table 1 indicates, on the access issue, the reoccurrent regularities focused on the teachers feelings that children will need the Internet for their future success, they must be taught the basics of research and information searching, and the Internet is not available in the students homes so this skill must be accessible for daily use at school. Despite these beliefs, the educators views on the applicability of Internet use in their own classroom seemed to run counter to the access issue. As Table 1 indicates under Applicability, the teachers,

especially in the lower elementary grades, consistently reiterated the belief that Internet use was beyond their students cognitive abilities. Instead of teaching computing and Internet skills, they felt time and money would be better spent on teaching the 3 R's.

Table 1

Exemplars of the Importance Category

Access:
1. Definitely it would be used if I had classroom access. It makes research exciting. They need it in the classroom for instantaneous use as a topic comes up in class.
2. Would be very important if we had daily access rather than once a week.
3. I don't think its important unless there is a specific question and we have access to in the room where we can immediately look it up.
4. It will be important and important for them to use it and be trained once we have it in the classroom.
5. I believe we are moving into the computer age. Within 10 years we will become dependent on the Internet.
Applicability:
1. It is not relevant for what we are doing in my elementary class. It should be concentrated upon middle and high school.
2. Important for limited use, not to be used/viewed by students as a toy.
3. The students don't really understand what the Internet is on their cognitive level.
4. Feel it should be introduced and modeled but they don't really need to use it.

Concerning the integration category, the reoccurring themes that emerged were Internet access and time. The one Internet connection, provided by ConnecTEN, is located in the library. As reflected in the teachers comments found in Table 2 under Access, the teachers perceived this as no access or inconvenient access for them and their students. Further, teachers did not feel that they were allotted adequate planning time or classroom time to integrate the Internet into their curriculum (see Table 2--Time). The teachers that did have some Internet integration into their curriculum, usually brought printouts from home or from the library, and often only used them for enrichment purposes.

Table 2

Exemplars of the Integration Category

Access:
1. I am not hooked up. If I was, I would be learning and teaching my children right now.
2. Would use it more if I had classroom access.
3. Would have used it for English and writing skills if I had better access--classroom access.
Time:
1. We need the time to sit down, plan, and figure how to work it into our curriculum.
2. I possess the skills but I haven't had the time.
3. Can't afford the time--too inconvenient.

The three factors influencing teachers' opinions on the adequacy of the amount of Internet training they received can be typologized as access, time, and instruction. As seen in Table 3, the faculty repeatedly referred to the need for daily classroom access. They stated this

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is needed to provide the hands on experience necessary to reinforce their training. The school administration must allot time for teachers to practice to the point that they achieve a mastery level of skill. The final reoccurring theme involved the need to restructure the training. Further, training needs to be provided during school time, preferably during in-service, and needs to focus on both basic and specific skills (see Table 3--Time and Instruction). Training must be ongoing, providing numerous sessions and intermittent follow-ups.

Table 3

Exemplars of the Training Category

Access:
1. Need more access. No practical way for me to apply it to my class.
2. I have not had access to test what I have learned.
3. I've had no chances to play on it.
4. I have not had daily access to use it.
Time:
1. I haven't received any in school training time. The school board tries to make us learn on our own time and own expense. It's not fair!
2. We have not had the proper time to use it. Need more time to use.
3. I need set aside time to force me to use it more and get more practice of new ways to use it.
Instruction:
1. No one explained to me the basics of surfing and sorting through information--what's good for teachers and classrooms.

2. The training knocked off my inhibition to using it. I'm now at the questioning stage.
3. A more structured tutorial would definitely benefit me.
4. I need to be trained in my own room and on computers I will be using in my classroom.
5. I'm to the point I'm not going to run all over the city, on my own time to get training.

Finally, the three patterns emerging from teachers' feelings on the effectiveness of the Internet training they received deal with access, time, and instruction. As indicated in the teachers comments found in Table 4 under Access and Time, the long term effectiveness of the training was diminished by the failure of the school to provide Internet access and the time needed for practice immediately following the training. Also, the majority of teachers did not feel confident in their ability to teach Internet skills to their students (Table 4--Instruction).

Table 4

Exemplars of the Effectiveness Category

Access:

1. It is not practical for 40 teachers to use one access point.
2. I never received adequate access to it, to use in an effective classroom setting.
3. Training was ineffective because I wasn't able to use it right away and I have forgotten much. I'm afraid it will be like starting over.

Time:

1. Training was constructive, focused--it helped me to see how I can find things if I had the time.
2. Not enough time and no time to practice. I have lost what I had learned.
3. I fell comfortable to explain it to students but I would need to have time to practice teach.

Instruction:

1. I have not been trained to teach others. I would want to have the proper procedures to teach children.
2. Not enough hands on, practical training.
3. My training is inadequate. The children know more than I do about technology.
4. I possess the skills because I've learned them on my own but I've had no structured program of study to teach its proper classroom use.

Interpretation of Results

The Internet Experience Survey and the Internet Training Survey both showed that a majority of Hamilton Elementary Schools faculty had not received Internet training. Of those teachers who were trained, most felt that they had not received enough or adequate training. Although 40% of the faculty on the Internet Training Survey admitted to attending at least one Internet Training session, only 26% of the faculty on the Internet Experience Survey indicated that they had some or much experience in using the Internet. This further indicates that even those teachers with training on Internet use do not currently use it. Finally, teachers who received Internet training were the group most likely to receive more. Of this group, a core group of three teachers became the technology trained elite, attending three or more trainings and technology showcase events. As indicated in the surveys and through my role as a participant-observer, it became obvious that this group is perceived by the administration and faculty as being the computer literate elite and are thus repeatedly offered additional opportunities for technology training.

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Through analysis of the ConnecTEN Teacher Interview questions, patterns concerning teachers' perspectives on their Internet training became even clearer. Throughout the categories of questions, a convergence of underlying themes became apparent. A cross-case analysis of the answers to each category of questions through creative synthesis revealed the emergent themes found in this study. From these themes an interpretation of the results is possible.

The ability to access the Internet was mentioned by teachers repeatedly throughout all of the categories. Teachers interpreted access as the ability to immediately connect to the Internet via a computer in their classroom. Further, this access needs to be available directly following Internet training so that the teachers can reinforce through practice the skills they have just learned. A central point of access, such as the library or computer lab, is viewed by teachers as inconvenient, or worse as no practical access at all. This case study supports the findings of Gallo and Horton (1994) that teachers need to have "direct and unrestricted access to the Internet" (p. 17).

A second emergent theme found bridging all categories concerns time. Teachers felt they had no time to learn, practice, plan, and use the Internet. Reiterating Stuckey (1995) and Tomei (1996), teachers need to be given the time to successfully integrate the Internet into their curriculum. Further, teachers believe that this time needs to be provided during the normal working day--on the clock hours. Teachers feel that their free time is a precious and limited resource. They think it is unrealistic and unfair of principals and school district officials to expect them to use their own time to seek training in the use of classroom technology. The school administration must allot time during the school day for teachers to connect to the Internet and master the skills necessary so that they can integrate it into their daily classroom activities.

Training concerns emerged as another pattern found throughout the teachers' responses. Other than as an introductory lesson, Internet training had not been provided during the school day or at an in-service. As Faison (1996) states, the college/university teaching programs

attended by Hamilton Elementary School's teachers did not teach them computing skills. Therefore, in support of the research of Edwards (1980) and Knapp & Glenn (1996), this case study found that a critical need for in-service training exists. Teachers felt that both basic and in-depth skills needed to be taught. Training needs to be more comprehensive, consisting of a number of sessions and accompanied by periodic follow-up sessions. The school needs to make the Internet training convenient (i.e. at the school, preferably in the teacher's own classroom), pay any costs or fees associated with the training, and conduct it during the school day. As one teacher stated, "I resent the fact that they make me learn [the Internet] on my own time. If they cared for me to learn it they would pay me to learn how to use it and provide training at our school."

A unique finding of this case study concerns teachers attitudes toward the Internet as reflected by the school's and the district's actions. For teachers to value a new tool, curriculum, or program, the school board must show a total and ongoing commitment to it. These commitments entail providing classroom access to the new tool, providing comprehensive on-site training, providing follow-up training, creating practice and planning time during the work day, and showing support to the teachers who use it on a daily basis. Anything short of this type of strong and ongoing commitment will lead teachers to believe that the newly introduced program is just merely another one of the scores of passing fads they have seen time and again throughout their teaching careers. Through the teacher interviews and in my role as participant-observer, it became apparent that few teachers felt the need to learn, use, or integrate the Internet into their curriculum. While the local and state administrations gave plenty of lipservice concerning the coming of Internet to the schools, their actions seemed to belie their words. Virtually no convenient access, time, or training were provided to the teachers by state or local school boards. For the most part, teachers who wanted to learn to use the Internet had to locate a training provider, provide their own transportation, be trained on their own time, and at

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their own expense. No rewards were given to those who learned to use it. No state or local curriculum mandates were made to require teachers to use it. Therefore, despite the administrators' talk most teachers placed little real value in the Internet and its school use.

Discussion and Implications

If this case is representative of the larger initiative, it is apparent that key changes must occur before teachers will be able to successfully incorporate the Internet into their daily educational environment. Meaningful access where teachers and students can immediately go to the classroom computer and quickly connect to the Internet for practice, planning, information retrieval, research, or whatever, is crucial. Allotted time, scheduled into the school day, where teachers can go to practice, plan, use, and hone their Internet skills to a mastery level must be written into the school board policy and provided for by the school administration. As Kellogg (1995) determined, Internet training must be on-site, during the school day, available to all teachers, broad-based yet customized to specific individual's needs, and accompanied by periodic follow-up sessions. Finally, an ongoing value must be placed upon the acquisition and use of the Internet by state, local, and on-site administrators to assure teachers commitment to integration of this tool into their classroom.

This study has indicated that Commissioner Walters' ConnecTEN dream of all teachers being afforded the opportunity and time to be adequately trained in the classroom use of the Internet has not yet materialized. Despite the highly touted nature of this program's launch, the program has so far had a very limited impact on the vast majority of teachers and therefore students. The overriding reason for ConnecTEN's limited effect is due to a lack of sufficient teacher training and support. Hopefully, in the near future, the state and local administrations will provide the necessary means to build upon the start that ConnecTEN has provided. In a recent

interview with Amy Bearman (personal communication, May 23, 1997), Executive Assistant to the Commissioner, she indicated that future Internet training was being planned on the state level. The focus is now going to be on how to train people to integrate the Internet into the curriculum, how to make it part of the natural classroom like books, filmstrips, videos, etc. Jackie Shrago (personal communication, June 12, 1997), Project Director of ConnecTEN, states that there needs to be a change in the notion of what training is--schools need to provide training time and practice time during the school day in their own school environment. Helen Todd (personal communication, June 13, 1997), Instructional Support Consultant for Memphis City Schools Board of Education, has recently taken it upon herself to provide this local support. Todd does most of her teacher Internet training onsite at the schools. She customizes training to specific school needs. Todd further states that the training must be ongoing because "if we don't continue training we'd might as well throw the computers away because they will not be used." While this training has not yet reached the faculty of Hamilton Elementary School, hopefully it will soon become something more than just words.

For ConnecTEN to accomplish these goals, a successful system-wide staff development program must be developed and implemented. Past research on teacher staff development training demonstrates the need for the training to be ongoing and sustained, practical in nature, applicable to the classroom, and must allow for teachers to expound upon their learning (Oja, 1989; Tally, 1995; Todd 1995). The time for talk is over, an action plan is needed. It is time to fully implement and integrate technology into every aspect of today's classrooms.

There are a number of implications for future practice, theory and research. ConnecTEN, being a pioneering project, needs every aspect of it thoroughly analyzed to determine all practical implications that it holds for future Internet projects. In the area of teacher training, research to find a suitable in-service program for teaching teachers to use the Internet needs to created or found. Elite interviews could be used to compare the ConnecTEN

project administrators' views to the teachers' views. A comparison study of the level of student use whose teachers use the Internet versus the teachers who do not. Finally, a study concerning the motivating factors behind those teachers who personally sought out training or learned on their own to use the Internet.

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